IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	: Christian Block et al.	Art Unit	: 2836
Serial No.	: 10/526,278	Examiner	: Scott Allen Bauer
Filed	: March 1, 2005	Conf. No.	: 6665
Title	: CIRCUIT ARRANGEMENT		

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APPEAL BRIEF

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I. Real Party In Interest

The real party in interest in the above application is Epcos AG.

II. Related Appeals and Interferences

The appellant is not aware of any appeals or interferences related to the above-identified patent application.

III. Status of Claims

Claims 1 to 21 were canceled.

This is an appeal from the decision of the Examiner in a final Office Action dated December 10, 2009, which rejects the remaining claims as follows:

Independent claim 22 was rejected under §103 over U.S. Patent No. 5,521,561 (Yrjöla) in view of U.S. Patent No. 6,822,295 (Larson).

The dependent claims were rejected under §103 as follows: Claims 23, 24, 26 to 29, 31 and 41 to 43 were rejected over Yrjöla in view of Larson; claim 25 was rejected over Yrjöla in view of Larson and Mizutani; claim 32 was rejected over Yrjöla in view of Larson and U.S. Patent No. 5,122,921 (Koss); claim 30 was rejected over Yrjöla in view of Larson and U.S. Patent No. 4,977,357 (Shrier); claims 33, 35 and 39 were rejected over Yrjöla in view of Larson and U.S. Patent No. 6,272,327 (Kurchuk); claim 34 was rejected over Yrjöla in view of Larson and JP02000134945 (Toshiba); claims 36 to 38 were rejected over Yrjöla in view of Larson, Kurchuk and U.S. Patent No. 5,276,422 (Ikeda); claim 40 was rejected over Yrjöla in view of Larson and U.S. Patent No. 6,072,993 (Trikha); and claim 44 was rejected over Yrjöla in view of Larson and U.S. Patent Publication No. 2002/0080537 (Landy).

IV. Status of Amendments

Appellant filed a Notice of Appeal and Pre-Appeal Brief Request For Review on February 19, 2010. In a Notice of Panel Decision dated June 15, 2010, the panel instructed that we proceed to the Board of Patent Appeals and Interferences.

V. Summary of Claimed Subject Matter

A. Background

This application relates to "a circuit arrangement having a switching unit, which is connected to a terminal for a high-frequency signal. Moreover, the switching unit is connected to additional signal leads. The terminal of the circuit arrangement is connected to a protection device against electrostatic discharges".[1]

B. Appellant's Claims

1. Claim 22

Independent claim 22 recites:

> 22. Circuitry for use in a mobile telephone, the circuitry comprising:
> a terminal for use with a high-frequency signal;
> at least two signal lines;
> a switching unit for connecting the terminal to a signal line; and
> a primary protection device for protecting against electrostatic discharges, the primary protection device being between the terminal and the switching unit, the primary protection device comprising a first element that diverts all voltages having a pulse height greater than a 200V switching voltage to a reference potential.

We refer to Figs. 1 and 3 of the application, which are reproduced below, as an aid for identifying support for claim 22. To this end, the versions of Figs. 1 and 3 below have been annotated to identify examples of the features claimed in claim 22.

As stated in the application,

> "Figure 1 shows a circuit arrangement having a terminal 1, which is suitable as an input or output for a high-frequency signal. In addition, a switching unit 3 is provided, which optionally connects terminal 1 to one of signal leads 21a, 21b, 21c, 22a, 22b."[2]

> "Figure 3 shows another embodiment for a circuit arrangement in which a protective element 52, which is a coil, is provided for primary protection device 41".[3]

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[1] Application, page 1, lines 5 to 8
[2] Application, page 12, lines 1 to 3
[3] Application, page 15, lines 17 to 19

FIG 1

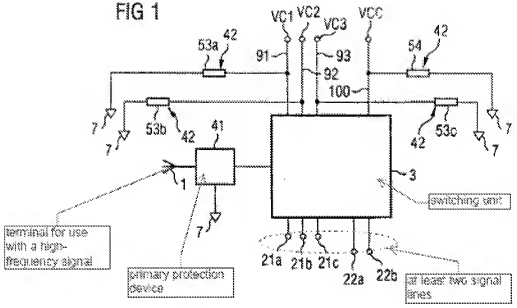
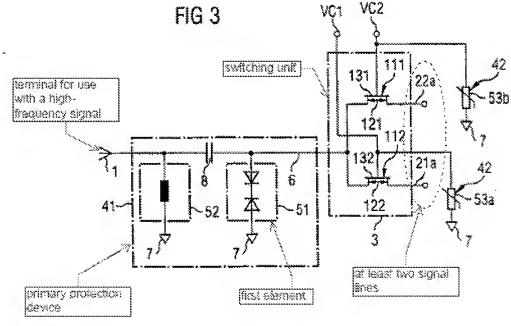


FIG 3



For the "terminal for use with a high-frequency signal", we find support for this feature on page 13, lines 5 and 6 of the application, which recite "[e]xternal terminal 1 may be used as a

high-frequency signal input or as a high-frequency signal output". Originally-filed claim 1 also identifies "a terminal (1) for a high-frequency signal".

For the "at least two signal lines", we find support for this feature on page 12, lines 2 and 3 of the application, which recite "[i]n addition, a switching unit 3 is provided, which optionally connects terminal 1 to one of signal leads 21a, 21b, 21c, 22a, 22b". Page 16, lines 2 and 3 of the application states that "[b]reak distance 121, 122 connects terminal 1 to a signal lead 21a, 22a." Originally-filed claim 1 also identifies "at least two additional signal leads (21a, 21b, 21c, 22a, 22b) which form transmission/reception paths".

For the "switching unit for connecting the terminal to a signal line", we find support for this feature on page 12, lines 2 and 3 of the application, in originally-filed claim 1 ("a switching unit (3) for connecting the terminal (1) to a signal lead (21a, 21b, 21c, 22a, 22b)"), and on page 15, lines 21 and 22 ("Furthermore, Figure 3 shows the internal structure of an exemplary switching unit 3").

For the following features:

> "a primary protection device for protecting against electrostatic discharges, the primary protection device being between the terminal and the switching unit",

we find support in Figs. 1 and 3 above and on page 12, lines 5 and 6 of the application, which states that "[a] primary protection device 41 connected to reference potential 7 is provided between terminal 1 and switching unit 3".

For the following features:

> "the primary protection device comprising a first element that diverts all voltages having a pulse height greater than a 200V switching voltage to a reference potential",

we find support in originally filed claim 1, which recites "wherein the primary protection device (41) contains a first protective element (51) which diverts all voltage pulses whose pulse height exceeds 200 V to reference potential (7)".

VI. The Ground of Rejection to be Reviewed on Appeal

Claim 22 was rejected under §103 over U.S. Patent No. 5,521,561 (Yrjöla) in view of U.S. Patent No. 6,822,295 (Larson).

VII. Argument

A. Art Rejection

1. Law of Obviousness

"It is well established that the burden is on the PTO to establish a prima facie showing of obviousness, *In re Fritsch*, 972 F.2d. 1260, 23 U.S.P.Q.2d 1780 (C.C.P.A., 1972)."

In *KSR Intl. Co. v. Teleflex Inc.*, 127 S.Ct. 1727 (2007), the Supreme Court reversed a decision by the Court of Appeal's for the Federal Circuit decision that reversed a summary judgment of obviousness on the ground that the district court had not adequately identified a motivation to combine two prior art references. The invention was a combination of a prior art repositionable gas pedal, with prior art electronic (rather than mechanical cable) gas pedal position sensing. The Court first rejected the "rigid" teaching suggestion motivation (TSM) requirement applied by the Federal Circuit, since the Court's obviousness decisions had all advocated a "flexible" and "functional" approach that cautioned against "granting a patent based on the combination of elements found in the prior art."

In *KSR* the Supreme Court even while stating that: "the Court of Appeals drew the wrong conclusion from the risk of courts and patent examiners falling prey to hindsight bias," warned that: "a factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning."

> The Court of Appeals, finally, drew the wrong conclusion from the risk of courts and patent examiners falling prey to hindsight bias. A factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning. See *Graham*, 383 U. S., at 36 (warning against a "temptation to read into the prior art the teachings of the invention in issue" and instructing courts to "'guard against slipping into the use of hindsight'" (quoting *Monroe Auto Equipment Co. v. Heckethorn Mfg. & Supply Co.*, 332 F. 2d 406, 412 (CA6 1964))). Rigid preventative rules that deny factfinders recourse to common sense, however, are neither necessary under our case law nor consistent with it.

With respect to the genesis of the TSM requirement, the Court noted that although "As is clear from cases such as Adams[4], a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.

[4] United States v. Adams, 383 U. S. 39, 40 (1966)

Although common sense directs one to look with care at a patent application that claims as innovation the combination of two known devices according to their established functions, it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does. This is so because inventions in most, if not all, instances rely upon building blocks long since uncovered, and claimed discoveries almost of necessity will be combinations of what, in some sense, is already known."

"The mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification." *In re Gordon*, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984).

> Although the Commissioner suggests that [the structure in the primary prior art reference] could readily be modified to form the [claimed] structure, "[t]he mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification." *In re Laskowski*, 10 U.S.P.Q. 2d 1397, 1398 (Fed. Cir. 1989).

a. Claim 22 was rejected under §103 over U.S. Patent No. 5,521,561 (Yrjöla) in view of U.S. Patent No. 6,822,295 (Larson)

Independent claim 22 recites:

> 22. Circuitry for use in a mobile telephone, the circuitry comprising:
> a terminal for use with a high-frequency signal;
> at least two signal lines;
> a switching unit for connecting the terminal to a signal line; and
> a primary protection device for protecting against electrostatic discharges, the primary protection device being between the terminal and the switching unit, the primary protection device comprising a first element that diverts all voltages having a pulse height greater than a 200V switching voltage to a reference potential.

We do not understand the applied art to disclose or to suggest at least the underlined features of claim 22 above. As explained on page 2 of the Office Action:

> Yrjölä does not teach a primary protection device for protecting against electrostatic discharges, the primary protection device being between the terminal and the switching unit, the primary protection device comprising a first element that diverts all voltages having a pulse height greater than a 200 V switching voltage to a reference potential.

Larson was applied to make up for the foregoing deficiency of Yrjöla vis-à-vis claim 22. In this regard, the Office Action relies on Fig. 1 and col. 2, lines 6 to 19 of Larson for its alleged disclosure of the foregoing features.[5] Fig. 1 is reproduced below.

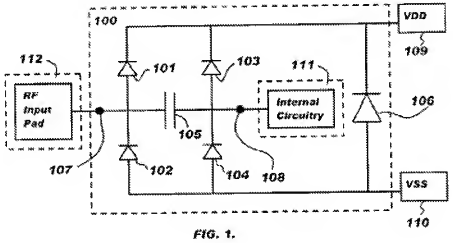


FIG. 1.

As explained in Larson, current is shunted either through PIN diodes 101, 103 or through PIN diodes 102, 104, depending on whether an over-voltage event is highly positive or highly negative. Zener diode 106 acts in response to current through PIN diodes 101, 103, which results in a highly-positive voltage at voltage source 109, to shunt current to negative voltage source 110.

The following excerpts describe the connections of the components in Larson, including the diodes.

> Referring first to FIG. 1, a preferred embodiment of the present invention an overvoltage protection device 100…comprises a first positive voltage PiN diode 101, a second positive voltage

[5] Office Action, page 3

PiN diode 103, a first negative voltage PiN diode 102, a second negative voltage PiN diode 104, a capacitor 105, a Zener diode 106, a signal node 107 and an internal circuitry node 108.[6]

The first positive PiN diode 101 is electrically connected to the signal node 107 and to a positive voltage source 109…The second positive PiN diode 103 is electrically connected to the internal circuitry node 108 and to the positive voltage source 109… The first negative PiN diode 102 is electrically connected to a negative voltage source 110 and to the signal node 107… The second negative PiN diode 104 is electrically connected to the negative voltage source 110 and to the internal circuitry node 108….[7]

The following excerpt describes how Larson operates in the event of a highly positive voltage at signal node 107.

The operation of the overvoltage protection device 100 is described next. Within a predetermined range of voltages, the PiN diodes 101, 102, 103,104 will each be in a reverse bias mode. A highly positive voltage event at the signal node will cause the first positive voltage PiN diode 101 to switch from reverse bias mode to a forward bias mode resulting in most of the current flowing through the first positive voltage PiN diode 101. A smaller portion of the voltage will pass through the capacitor 105 and may cause the second positive voltage PiN diode 103 to switch from reverse bias mode to a forward bias mode resulting in a significant portion of the remaining current flowing through the second positive voltage PiN diode 103…A highly positive voltage at the positive voltage source 109 created by the flow of current through the positive voltage PiN diodes 101 or 103 may cause the Zener diode 106 to "breakdown" and further shunt the positive voltage to the negative voltage source 110. The Zener diode 106 will breakdown when the voltage difference across its terminals is greater than a breakdown voltage of the Zener diode 106. The breakdown voltage should be set above a normal state voltage difference between the positive voltage source 109 and the negative voltage source 110. The negative voltage source 110, acting as a ground, allows the voltage event to dissipate whereby the internal circuitry 111 is substantially protected from a highly positive overvoltage event.[8] (emphasis added)

The following excerpt describes how Larson operates in the event of a highly negative voltage at signal node 107.

A highly negative voltage event at the signal node 107 will cause the first negative voltage PiN diode 102 to switch from reverse bias mode to a forward bias mode resulting in most of the current flowing through the first negative voltage PiN diode 102. A smaller portion of the voltage will pass through the capacitor 105 and may cause the second negative voltage PiN diode 104 to switch from reverse bias mode to a forward bias mode resulting in a significant portion of the remaining current flowing through the second negative voltage PiN diode 104. Depending upon the magnitude of the highly negative voltage event, the relative size of the negative PiN diodes 102, 104, the rise time of the highly negative voltage event, the amount of the highly negative voltage event that was shunted by the first negative voltage PiN diode 102 and other affecting criteria, the second negative voltage PiN diode 104 may or may not switch to a forward bias mode during a highly negative voltage event. The negative voltage source 110 further allows the voltage

[6] Col. 1, lines 56 to 62
[7] Col. 3, lines 7 to 28
[8] Col. 3, line 48 to col. 4, line 13

> event to dissipate whereby the internal circuitry 111 is substantially protected from a highly positive overvoltage event.[9] (emphasis added)

Thus, Larson describes different elements for protecting against negative and positive high voltage levels. This is different from claim 22, which recites a primary protection device that comprises a first element that diverts all voltages having a pulse height greater than a 200V switching voltage to a reference potential. In response to this argument, the Office Action states:

> height greater than a 200V switching voltage to a reference potential. Applicant states that Larson teaches circuitry having different elements for protecting against negative and positive high voltage levels which is different than having a primary protection device that comprises a first element that diverts all voltages having a pulse height greater than a 200V switching voltage to a reference potential. It appears as though Applicant's main argument is that it takes three elements to divert all voltages having a pulse height greater than a 200V switching voltage to a reference potential. However, the three devices that make up the first element of Larson can all be taken together to be a current protection element. A claim is read to be given the broadest reasonable [10]

We note, however, that the crux of our argument is not merely that we have a single "first element", but that the claimed first element diverts all voltages (regardless of polarity) having a pulse height greater than 200V to "a reference potential". That is, all voltages having a pulse height, whether it be positive or negative, are diverted to a reference potential. Since we recite only "a reference potential", that means that all voltage having pulse height that is greater than 200V are diverted to the same reference potential. We do not believe Larson to disclose or to suggest this.

More specifically, as explained above with respect to Fig. 1 of Larson above, a highly positive voltage event will cause excess current to flow to VDD 109, whereas a highly negative voltage event will cause excess current to flow to VSS 110. Thus, in Larson, current resulting from high voltages will flow to different potentials (VDD or VSS), not to the same reference potential. By contrast, claim 22 requires that a first element to divert all voltages having a pulse height greater than a 200V switching voltage to a reference potential. We believe this to be

[9] Col. 4, lines 14 to 34
[10] Office Action, page 12

clearly different from Larson. Accordingly, even if Larson were combined with Yrjöla in the manner suggested in the Office Action, the resulting hypothetical combination would fail to disclose or to suggest all of the features of claim 22.

Accordingly, claim 22 is believed to be patentable over the applied art. The remaining claims depend, ultimately, on claim 22 and partake of its novelty.

Conclusion

For at least the foregoing reasons, Appellant submits that Claims 22 to 44 are allowable over the applied art. Therefore, the Examiner erred in rejecting Appellant's claims and should be reversed.

The undersigned attorney can be reached at the address shown below. All telephone calls should be directed to the undersigned at 617-521-7896.

Please apply any deficiency in fees or credits due in this case to Deposit Account 06-1050 referencing Attorney Docket No. 14219-079US1.

Respectfully submitted,

Date: July 15, 2010

/Paul Pysher/

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Appendix of Claims

1 to 21. (Cancelled)

22. (Previously Presented) Circuitry for use in a mobile telephone, the circuitry comprising:

a terminal for use with a high-frequency signal;

at least two signal lines;

a switching unit for connecting the terminal to a signal line; and

a primary protection device for protecting against electrostatic discharges, the primary protection device being between the terminal and the switching unit, the primary protection device comprising a first element that diverts all voltages having a pulse height greater than a 200V switching voltage to a reference potential.

23. (Previously Presented) The circuitry of claim 22, wherein the first element has an insertion attenuation that is less than 0.3 dB.

24. (Previously Presented) The circuitry of claim 22, wherein the first element has a capacitance that is less than 1 pF.

25. (Previously Presented) The circuitry of claim 22, wherein the first element comprises a gallium arsenide double diode.

26. (Previously Presented) The circuitry claim 22, wherein the primary protection device comprises a circuit path that connects the terminal and the switching unit; and

wherein the first element connects the circuit path to the reference potential.

27. (Previously Presented) The circuitry of claim 22, further comprising:

a second element that is in parallel with the first element, the second element for limiting a current load of the first element.

28. (Previously Presented) The circuitry of claim 27, further comprising:

a capacitor on a circuit path between the first element and the second element

29. (Previously Presented) The circuitry of claim 27, wherein the second element comprises is a discharger.

30. (Previously Presented) The circuitry of claim 27, wherein the second element comprises a polymer suppressor.

31. (Previously Presented) The circuitry of claim 27, wherein the second element comprises an over-voltage component having a capacitance that is less than 1 pF.

32. (Previously Presented) The circuitry of claim 27, wherein the second element comprises an inductive element having an inductance that is greater than 18 nH.

33. (Previously Presented) The circuitry of claim 22, further comprising:

circuit paths that provide control signals to the switching unit, each of the circuit paths comprising a secondary protection device for protecting against electrostatic discharges.

34. (Previously Presented) The circuitry of claim 22, further comprising:

a circuit path for supplying for an operating voltage to the switching unit, the circuit path comprising a secondary protection device for protecting against electrostatic discharges.

35. (Previously Presented) The circuitry of claim 22, wherein the switching unit comprises field effect transistors, a contact break distance of each of the field effect transistors connecting the terminal to a signal line; and

wherein the circuitry further comprises:

circuit paths that connect to gates of the field effect transistors, the circuit paths

for providing control signals to the gates, each of the circuit paths comprising a secondary protection device for protecting against electrostatic discharges.

36. (Previously Presented) The circuitry of claim 33, 34 or 35, wherein the secondary protection device comprises a voltage-limiting element having a switching voltage that is less than 100 V.

37. (Previously Presented) The circuitry of claim 36, wherein the voltage-limiting element comprises a varistor.

38. (Previously Presented) The circuitry of claim 36, wherein the voltage-limiting element comprises a Zener diode.

39. (Previously Presented) The circuitry of claim 35, wherein at least one secondary protection device is connected to the reference potential.

40. (Previously Presented) The circuitry of claim 22, wherein the switching unit comprises PIN diodes.

41. (Previously Presented) The circuitry of claim 22, wherein the switching unit comprises a gallium arsenide switch.

42. (Previously Presented) The circuitry of claim 22, wherein the terminal comprises an antenna input of a mobile telephone.

43. (Previously Presented) The circuitry of claim 22, wherein the signal lines comprises transmitting and receiving paths of the mobile telephone.

44. (Previously Presented) The circuitry of claim 22, wherein the switching unit and the primary protection device are integrated into a multi-layer ceramic substrate.

Evidence Appendix

None

Related Proceedings Appendix

None